The Excavating Engineer

Vol. 18 FEBRUARY 1924 No. 2

The Detroit Sewage Program — II

The Ashland Avenue System

NOTE: — *This is the second of a series of articles that will appear in The Excavating Engineer concerning Detroit's Sewage Program. The story of this work should prove to be of interest to our readers for two reasons: first, because it is the largest sewer in the world; secondly, because the work is done almost entirely by dragline excavators.*

THE second of the four main sewer systems under construction in Detroit is the Ashland Avenue System, which although of considerably smaller proportions is an interesting piece of work and worthy of note.

This system is about one mile east of and runs parallel to the Conner's Creek System. It starts in at Fox Creek at Jefferson Avenue to Alter Road and thence north.

The system is divided into two sections. The contract for Section 1 was awarded to Julius Porath, well-known contractor of Detroit, at a price of $51.00 per linear foot and extends from Jefferson Avenue to Waveney Avenue on Ashland, a distance of 6500 feet.

This system will consist of a one-barrel sewer, 16 feet 2 inches inside measurements, with 16-inch concrete walls, the top of which will be made flat and will form the base of a concrete road for the first 3,000 feet. The remaining portion cannot be used for this purpose, owing to the depth of the cut. Reinforcements 6 feet x ⅞ inch will be used to bind the base of the road, which will be considerably wider, to the concrete.

The gravel aggregate for the job is excavated from Lake St. Claire and is brought to the foot of Ashland Avenue in scows, where it is loaded into bins. From here it is taken to the job in trains of one-yard Lakewood narrow gauge cars and hauled by a Fate-Root-Heath gasoline locomotive. The method of concreting is similar to that used on the Conner's Creek contracts, except that in addition to the Blaw-Knox collapsible forms, an invert form is necessary because of the circular base.

Both the invert form and the arch are fifty feet long. After the concrete has hardened to a considerable degree, the invert form is raised from the concrete by means of four chain falls attached to cross beams, which are moved ahead on tracks as the work progresses. A Rex concrete mixer, mounted on a movable platform, is used for mixing the concrete.

The excavation is being done by a Bucyrus Class-9½ dragline, which maintains an average of 500 cubic yards daily. The total excavation amounts to 66,000 yards.

The dragline is making a cut 15 feet deep and 25 feet wide at the top, and rounding at the bottom on about an 8-foot radius.

Every effort is being made to maintain 50 feet of excavating and concreting a day and only a cloudburst will stop the work. The material, consisting of a heavy clay, is hauled to Lake St. Claire where it is dumped on a spoil bank.

Almost all of this section was paved, and the problem of breaking up the old pavement was a serious one. At first, a piledriver hammer was used, but this made the path of the tracks to the dump so rough that another method was employed. Jackhamer drills were used to drill holes at frequent intervals, after which the dragline broke up the material with very little difficulty. Further use of the dragline was made when the collapsible and invert forms were to be drawn forward.

Ashland Avenue — 2nd Section

The contract for the second section was awarded to Albert Tobin, contractor of Detroit, at the contract price of $46.00 per foot. This section consists of 5,600 feet of the one-barrel type, a continuation of Section 1.

The cut which is taken by a Bucyrus Class-14 dragline is 16 feet 2 inches wide at the bottom and 36 feet wide at the top, the average depth being 35 feet, a considerably greater depth than on Section 1.

This machine is equipped with a 2-yard Page bucket, and has excavated up to the time of writing an average of 1200 yards per day. The total

Laying the Inverts — Section 2, Ashland Avenue Work

Davis & Bentley's Bucyrus 20-B Equipped with Clamshell Attachment on Albert Tobin's Contract, Second Section, Ashland Avenue

Albert Tobin's Class-14 on Section 2

Another View of Albert Tobin's Class-14 Digging

Blaw-Knox Collapsible and Invert Forms, Showing the Mixing Plant

Views of Sewage Program, City of Detroit

amount of excavation will amount to 1,100,000 yards. A McMyler clamshell machine is being used to clean out after cave-ins, while an Erie shovel is being used for backfilling.

A Bucyrus 20-B dragline with a ¾-yard bucket and a 35-foot boom is being used to smooth over the backfill left by the Erie shovel. This fleet of machines move ahead in clocklike regularity, about fifty feet a day, while the concreting follows closely in its wake. The concrete is hauled from the Ransome 1-yard stationary mixer in Koppel 1-yard cars, drawn by a Whitcomb gasoline locomotive with four cars to a train. Manholes occur at intervals of 1000 feet. The Bucyrus 20-B dragline is a rented machine, being placed on the work by Davis & Bently, excavating contractors of Detroit.

Showing Method of Moving Invert — In the Background May Be Seen the Operation of Pouring Over the Completed Arch.

Julius Porath's Class-9½ Dragline

Another View of the Same Machine Loading into a Truck

W. J. Conners' Bucyrus 20-B Draglines in the Course of Erection

A Section of the Completed Road — W. J. Conners is the Second Gentleman from the Left

Rock Crusher Crushing Rock Taken from St. Lucie Canal Spoil Bank

A Specimen of the Jungle Before the Work Was Started

The Conners Highway Through the Florida Everglades

Description of the Construction of a Remarkable Highway Through Country Considered to Be Impenetrable Swamp and Jungle — Dragline and Dipper Dredge Operation

SUCH is the title of one of those remarkable ventures that at times almost startle us by their bold originality. An up-to-date rocked and asphalted road some seventy-five miles long, through the heart of the Everglades to the shores of that magnificent inland sea Lake Okeechobee, thence south along its eastern shore some twelve miles to Bacom's Point, and north from the Point where the Palm Beach Canal enters the lake some thirty-five miles to Okeechobee City, is now building and probably sixty per cent completed.

Outline Map Showing Where Conners Highway is Under Construction

To construct seventy-five miles of good tar road sixteen feet wide over a level country under ordinary conditions is no great or expensive task, but to build such a road as this over slimy wet muck from eight to sixteen feet deep for probably forty miles of the entire distance, involves expenditures of unknown amounts and so many unlooked for obstacles, unforeseen by even the most experienced engineers and constructors, that the simple contemplation of such a task would discourage any ordinary man.

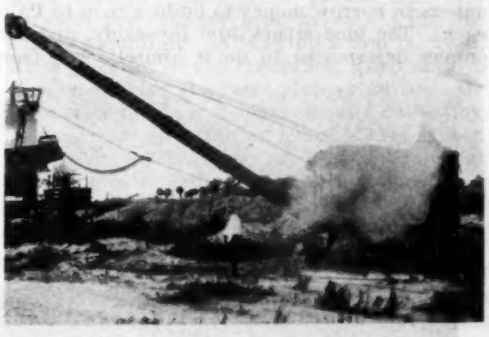
W. J. Conners, the Man

However, W. J. Conners, of Buffalo is not an ordinary man. Mr. Conners has a career which is typically American. When 13 years old he started work on a steam boat. At the age of 28 he launched into business for himself as a freight contractor. Early in his career he apparently recognized the importance of road-building in this country, as in 1888 he engaged in the asphalt and street paving business. In 1895 he started his career as a publisher, acquiring the Buffalo Inquirer and two years later the Buffalo Courier.

In 1916 he organized the Great Lakes Transit Corporation and bought all the railway and operated steam ships on the Great Lakes. Then his eyes turned southwards to the Everglades. In 1917, he bought and commenced reclaiming 17,000 acres of Everglade land, which land is now cultivated to sugar cane and fruit. It is this development that led him to even greater things.

The uncertainties of this road-building project, when summed up, remind one of Mr. Flagler's sea-going railroad from Miami to Key West, started in 1905 and finished in 1913, twice almost washed away by tropical hurricanes and the money cost of which no one ever dared to even mention. Men of sufficient capital and vision to undertake such projects are seldom met with and no Hall of Fame is needed to perpetuate their memories.

Briefly stated, this road is a continuation of the Okeechobee Road or military trail which now runs twenty miles west of Palm Beach on the north side of and parallel to the Palm Beach Canal. Here we come to a swing bridge, and from there on the Conners Road runs on the south side of the canal almost in a due northwest line to Lake Okeechobee, passing the new sugar mill a mile from the lake.



W. J. "Fingy" Conners Standing Before His Bucyrus 20-B Dragline

On reaching Lake Okeechobee the road splits as before mentioned, one branch going south and one north, along the shore of Okeechobee City thirty-six miles. More than two-thirds of the distance the rock dredged from the bed of the canal by four dipper dredges is placed on the soft mucky banks, and after settling is gone over again till the grade is reached, and it is then leveled off both by machine and hand labor and finally covered with a heavy coating of asphalt.

The dredges work continuously night and day with three eight-hour shifts, and in spite of heavy rains and flood conditions every effort is being

made to fulfill the promise that December 1 will see the completion of this bold project.

Along the Lake shore the fill is being built by dragline excavators, and a large rock crushing plant capable of putting out one thousand tons a day of crushed and washed rock is operating at the Lake end of the St. Lucie Canal, and an industrial railroad with numerous cars and three locomotives will distribute this rock north and south of the crusher plant till the work is finished.

Dragline and Shovel Operation

The dragline work is being done by five small dragline excavators, three of which are gasoline operated, and the two latest additions to this outfit being steam machines with oil-burning equipment under the boilers. These last two machines were installed in June. They are Bucyrus 20-B combination shovels and dragline excavators.

With shovel equipment these machines are being used for excavating loose rock, a soft limestone which has been cast into the spoil bank from the canal which runs alongside, by dipper dredges. This rock is crushed and used for paving the roads. To suit the shovels for this service they are equipped with ¾-yard YZ steel dippers.

As dragline excavators they are equipped with 35-foot booms and ¾-cubic-yard buckets and are used to throw up the fill for the road.

Not over a year ago a man went to W. J. Conners to borrow money to build a road to Palm Beach. The idea struck him favorably, and Mr. Conners determined to do it himself, and from that time on he threw the whole weight of his money and energy into the project.

When Mr. Conners was in Jacksonville recently he was quoted as saying that he had just taken over contract for the construction of the 8 miles of road between Okeechobee City and the Kissimmee River to connect with his road at Okeechobee and carry it to the Highland County line, the contract figure being approximately $200,000.

In a recent interview in the Jacksonville Times Union, Mr. Conners is quoted as follows:

"The highway will cost between two and three millions but the enterprise does not seem foolhardy to me. I estimate that there are 150,000 people in north Florida, 300,000 people in west Florida and probably 150,000 more in Southern Florida. These people will travel, communication must be established between these sections, and the toll road which I am building is an important

Finished grade on canal bank. Ready for rolling and asphalting. Six miles from the Lake.

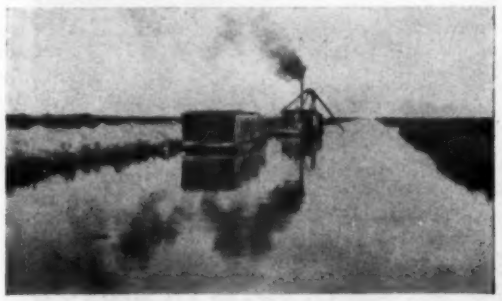
Completed Grade on Conners Highway Showing a 30-B Dragline in the Background

means by which the state can be traversed. All of the grading for the thirty-mile stretch between Canal Point and Okeechobee City has been completed and the rock will be put down within a short time. Railroad tracks have been laid, and I have six gasoline locomotives operating over this line to carry rock, machinery and other equipment for the completion of the road. The work was started on May 1 and will be finished by December 15."

Ultimate completion of the road is thus not far off and the shores of Lake Okeechobee, and incidentally the whole Lake, will be approachable as never before, and it will be possible to connect up with the outside world in as many hours as it formerly took days.

No truer description of Lake Okeechobee was ever printed than that found in the encyclopedia —"Nearly all the shores of this famous lake are impenetrable swamp and jungle and the Lake itself almost inaccessible." Those who for the past twenty years have gone through the greatest hardship to reach this place, and settle on the lands are, of course, those who most appreciate the value of Conners Highway.

Lack of transportation both for passenger and freight service has up to now held back development of the rich trucking lands along the Lake shore. Only those who have lived on the borders of this wonderful sheet of pure fresh water twelve hundred square miles in extent can form any idea of its beauty and freshness under all varying conditions. Its salubrious climate and remarkable freedom from mosquitoes is the wonder of all who have lived there the year round.



Dredge No. 3 Four Miles from the Lake

It is said to have a big future as a pleasure resort, threatening indeed in its popularity the most famous resorts of the South.

The W. J. Conners Highway Department has its headquarters at West Palm Beach, Florida.

We acknowledge our indebtedness to the *Manufacturers Record* which, on October 11th, published an interesting article on this work by Robert Ranson of West Palm Beach.

Locating Motor Truck Noises

By P. L. Sniffin

The excavating engineer is often called on to answer questions brought up by his truck drivers on the operation of the trucks. Although he is not expected to have the knowledge of an expert mechanic, he should have at least some understanding of the important points so that he will be able to supervise the drivers.

It is quite important and not very difficult to locate a symptom of trouble in a motor truck by training the ear to detect noises that occur in the engine and chassis. Here is a good guide to follow:

Knocking or rattling sounds are usually the result of wear in the connecting rods or main bearings, though often a very sharp knock, such as might be attributed to a loose bearing, is due to carbon deposits in the cylinder or combustion chamber, premature ignition due to advanced spark lever, or a loose flywheel. Dry bearings are invariably indicated by squeaking sounds, and whenever this signal of distress is heard, the engine should be stopped immediately and oil applied to the parts which have indicated their dry condition.

Leaks produce whistling or blowing sounds; a sharp, definite-pitched whistle denotes the escape of gas under pressure, and is usually produced by a defective packing or gasket that is used between the cylinder head or as a joint for the exhaust manifold. A blowing sound is caused by leaky packing in the crankcase, worn main bearings or wearing the valve plunger guides. Grinding noises in the motor are usually caused by the timing gears, and will be heard if these gears are dry or if they have become worn. Minor rattles often indicate nothing more serious than too great clearance between the valve stem and their operating plungers, or wear in the valve plunger guides. Any loose driving connections anywhere on the engine will contribute its quota of noise, and often a combination of sounds are produced that will be very annoying even if they do not indicate serious wear.

A question which often arises in the mechanical side of motor truck operation is that of locating the cause of a noise coming from the rear axle. This may be due to several things. The construction of some differentials naturally produces a humming sound. But if a harsh grating sound is heard, or, in the case of some trucks, any noise whatsoever, there is some defect which will require immediate attention. Some causes are lack of oil, use of the wrong grade or a poor grade of oil, gears out of alignment, chipped, burred or broken teeth, or, in the case of an old truck, worn-out gears may be the cause of the noise. If the insertion of new lubricant in the differential hous-

(Continued on page 67)

Digging the Dixie Highway in Kentucky

The Van Diver Construction Company Have Nearly Completed Grade on a 50,000-yard Road Job in Rockcastle County — Increasing Shovel Output with Tractors

DOWN in Rockcastle County, Kentucky, the Van Diver Construction Company, of Herrodsburg, are approaching the end of their grading operations on a heavy piece of highway work, the Dixie Highway, on what is known as the Mt. Vernon-London Road.

The project runs from Caloway Schoolhouse to Livingston 2.7 miles southeasterly. This is a typical modern road following in general the old location, but in many points where grades and curvatures require improvement it has been relocated. J. Harvey Van Diver has put on to the job an outfit of up-to-date equipment, and the manner in which he has bucked the many difficulties presented, in the form of weather conditions, inability to secure labor and constant contact with heavy rock digging, is most commendable.

The Excavation Involved

The contract was with the State Highway Department, and called for grading and constructing drainage structures and surfacing to a width of 16 feet with waterbound macadam, surface treated.

Probably over 50,000 cubic yards of excavation have been involved. The estimated classifications at the time the work was let, however, were somewhat below this, being 28,409 cubic yards of earth, 9,714 cubic yards of solid rock and 620 cubic yards of borrow. This was awarded at 40c for earth and $1.30 for rock excavation. The rock was mostly sandstone and limestone, which according to Mr. Van Diver was the toughest he has ever encountered.

The drainage structures called for 388 cubic yards of concrete, 20,296 pounds of reinforcement and 544 linear feet of pipe culverts.

In spite of many difficulties which confronted him he has made commendable progress. Labor was scarce and difficult to obtain, the weather unfavorable over a large period of time, and, furthermore, he had to buck a stratum of rock near a double coal vein which resulted in very hard digging.

Work was started in October, 1922, and at the time of writing the grading has been completed and the hard surfacing is about 50% complete, except for the mountain slides which are still sliding in on him as we go to press.

Equipment Used

Mr. Van Diver purchased for this work a Bucyrus 20-B, ¾-yard shovel, caterpillar mounted. Additional equipment consisted of a used ½-yard

The Van Diver Construction Company's highway work in Rockcastle County near Livingston, Kentucky. Five Fordson tractors with Western dump wagons and six teams served the 20-B Bucyrus. The digging encountered was exceptionally heavy.

1 — A part of completed highway. 2 — This is the best we could get of J. Harvey Van Diver himself. He is the figure in a white shirt on the running board. 3 — Dewitt Van Diver is the gentleman on the running board. 4 — The 20-B Bucyrus heading into a cut. It is served by teams and Fordsons. A double cut was taken at this point.

Jaeger gasoline mixer, a Schramm portable gasoline-driven air compressor, a Sullivan air compressor driven by a Fordson Tractor, an Ingersoll-Rand drill, and six 2-yard Western dump wagons.

After the job was well under way he found that his equipment would not take the earth away from the shovel fast enough to suit him, so he installed five Fordson Tractors in order to speed things up. The average tractor haul has been about 100 yards, each tractor taking a wagon. He has hauled with the five tractors, weather conditions permitting, 600 yards of earth in a 10-hour day, which is, of course, far more than an equal number of teams could do under similar conditions.

Shovel Operation

The shovel work, as stated, was heavy. The material was clay, a material of the consistency of chert, sandstone and limestone.

The little shovel has given an excellent account of itself. S. B. Bush, its operator, states that its caterpillar mounting made it very flexible. He was able to climb rock surfaces and wade deep mud with no trouble. The output, of course, has varied considerably and no reliable figures are available. Mr. J. Harvey Van Diver states that the shovel is fast and states further as follows: "As for the 20-B it has given fine service and I am highly pleased with it in every respect. If I

(Continued on page 74)

Part of a Rock Cut Through Which the 20-B Dug

How Colorado Builds Her Roads — These views show Federal Aid Project No. 182 across Battle Mountain, from Gilman to Redcliffe, Colorado, under construction. Connelly & Knowlton had a subcontract under Peterson, Shirley & Gunther and used a 14-B Bucyrus. This project was completed last year.

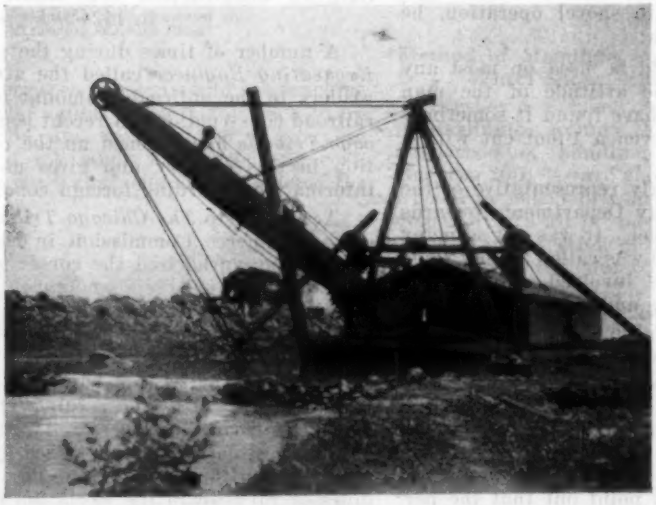
Bill Woodward, the Operator

E. E. Collins, of Miami, Florida, is busily engaged in furnishing rock for an extensive road-building program under way in connection with the development of Coral Gables subdivision, "Miami's Master Suburb," which with other districts of that city promises to be one of the playgrounds of the country rivaling in beauty the famous Los Angeles district.

Mr. Collins is using a new 20-B Bucyrus. He is now loading 500 to 600 yards of rock per 10-hour shift in spite of the fact that he is idle part of the time on account of being served by but eight 3½-yard trucks on a mile haul. He expects to add to this equipment in the near future when he intends to put out 900 yards a day. He is burning 1½ cords of wood, using the same timber as is shown in this photograph. The shovel is equipped with a standard coal-burning boiler. The overburden is very light, and the rock when shaken makes good digging with a 15-foot face.

E. E. Collins Himself

Stryker & Stryker of Red Bank, New Jersey, have a job on Route No. 4, Section 16, Burlington County, New Jersey, consisting of 46,000 yards of fill and 41,000 yards of excavation. They are dumping 5 dipper loads in each truck loaded in six minutes, and loading ten trucks per hour regularly with their Bucyrus 20-B, ¾-yard shovel. They have dispensed with a pit crew because of the unique manner of handling their pontoons, which is described under Field Notes on page 67 of this number. H. T. Barber, Superintendent, is responsible for the precision of the organization, which on this job is a pleasure to the eye of any contractor. In fact, "Doc" L. H. Stryker, the carburetor of the firm, says that if Barber does not blow, and John Lynch, the fill foreman, comes to life, the firm is bound to make a million dollars before 1973. Candidly, we are more optimistic on this date than is "Doc"; Raymond de Graw is operator, and he is the author of the kink above mentioned and various others that make the shovel hop. Henry L. de Graw, Sr., has accepted the position of fireman. He does not appear to need much supervision.



An Old Timer. A photograph of Bucyrus Dipper Dredge No. 138 taken on her last job in the summer of 1920 in Toledo, Ohio. The photograph was sent to us by Mr. Edward Bodette, contractor of Toledo, the owner of the dredge. This dredge started its career in 1903. It was originally a chain drive but was changed to wire rope in 1911. Mr. Bodette began his dredging career in 1885 under George Williams, as a "Rousty" at a salary of $15.00 a month, "rain or shine," as he says.

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The Small Revolving Shovel and Highway Work

Among the reports received from State Highway Engineers throughout the country for our 1924 Highway Review was one from H. J. Knelling, Construction Engineer for the Wisconsin State Highway Commission. In answer to our question as to the amount of excavation adaptable during 1924 to shovel operation, he replied in part as follows:

"A steam shovel could be used on most any job, depending upon the attitude of the man running the work. We have found it sometimes economical to take out even a 1-foot cut with a shovel."

This statement is fairly representative of the attitude of State Highway Departments towards the use of the power shovel. It was not so many years ago when the shovel was called in only when some heavy cutting was involved. But today, within the limits of cities and in county highway work, there are very few road jobs on which the power shovel is not a part of the equipment.

It would probably be absurd to attempt to analyze the reasons for this remarkable growth in the use of the small revolving shovel, beyond the very obvious one of the growing knowledge of the economy involved. However, it would not be far from the mark to point out that the perfection of the caterpillar mounting to the degree that manufacturers have attained within the past few years has contributed in no small measure thereto. A shovel will be used most where there is the greater prospect for work to keep it busy in the district.

In the far reaches of Canada teams and scrapers still do work which is being done by shovels in more thickly settled portions of the continent. But it is not too much to say that this machine is fast making a bid for the most useful and profitable tool that a road contractor can own.

Diesel Shovel Costs — A Correction

Our attention has been called to the fact that on page 13 of our issue of January, 1924, in which we gave some figures on the fuel consumption of K. L. Goulter Company's 30-B Diesel shovel, that we made a typographical error in citing the consumption of engine oil. This machine was represented as consuming at the time the article was written an average of 14 gallons of fuel oil in 8 hours which cost 9c a gallon delivered at the machine. Our article further read as follows:

"This machine is also using 5 gallons of heavy engine oil and half a pound of grease, and the same amount of gear 'dope' in 8 hours." This should have read as follows: "This machine is also using 5 gallons of heavy engine oil in 8 *days*, and half a pound of grease and the same amount of gear 'dope' is used in 8 hours."

This error is obvious, but we desire to take this occasion to make this correction.

Railroad Construction Will Show an Increase in 1924

A number of times during the past year *The Excavating Engineer* called the attention of its readers to the noticeable amount of increase in railroad construction. A recent issue of *The Chicago Tribune* has summed up the railroad situation in this country and gives us enlightening information regarding foreign conditions.

According to *The Chicago Tribune*, the Interstate Commerce Commission in the last twelve months has authorized the construction of 881.5 miles of road, and the abandonment of 523 miles. Applications for the authorization of construction of 2,487 miles were pending when the Commission issued its last report.

Railway construction has not stopped in the rest of the world as the result of the war. The world's railroads have increased 50,000 miles since 1913, according to a review issued by a New York financial institution. There are now about 750,000 miles of railroad in the world, an increase of 50 per cent in the present century.

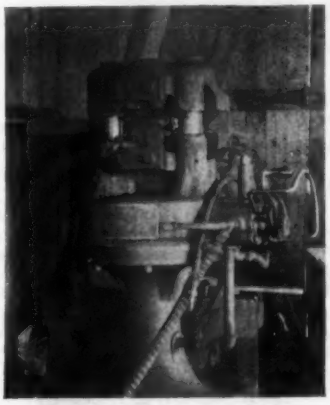
The United States still has somewhat between 35 and 40 per cent of the rail lines of the world, but our proportion will probably shrink rapidly as the rest of the world becomes equipped.

The next big chapter in railroading will be enacted in the tropical countries, where there are only from three to seven miles of railroad per 1,000 square miles of area, as compared to 82 for the United States and 62 for Europe.

· FIELD NOTES ·

Convenient Drill Sharpening

At the quarry of the Virginian Limestone Corporation, has been developed a very good plan of conveniently handling drill sharpening problems. Before this plan was put into effect one of the big jobs around the quarry was that of running the steel between the drills and the machine shops and back again. Too many men were employed at this, and the one item of carrying the steel added too much to the drilling cost, resulted in too much confusion and hampered the operating of the drills, and in addition to this, imposed too great a burden on the shops.



Ingersoll-Rand Drill Sharpener on "Traveling Machine Shop"

The Virginian Limestone Corporation's "Traveling Machine Shop"

Mr. Bobbitt, Superintendent of the Virginian Limestone Corporation, figured a way out of this difficulty. He took an old Vulcan shovel for which the company had no use, stripped it of machinery, patched up the body and mounted on it all the necessary drill sharpening equipment. This "traveling machine shop" is equipped with a forge, anvil, Ingersoll-Rand air-driven drill sharpener, and such tools and small appliances as are necessary to handle the work conveniently.

As the steam shovel's regular railroad trucks were left on this traveling shop, it can be hauled to any location that is most convenient at any particular time. Thus the distance from the point where the drilling is done and the point where the drills are sharpened is always the shortest possible distance and the steel is conveniently transported between the two places. There is one distinct advantage in the fact that the regular machine shop is relieved of all this work which is now handled in the shop that has facilities installed wholly with this idea in mind. The only connection between the traveling shop and the plant is an air line that is run out from the compressor.

Producers who have a problem similar to this one of the Virginian Limestone Corporation, may see in this solution, a solution of their own difficulties. — *Pit and Quarry.*

Method of Handling Pontoons Under Traction Wheel Shovel Eliminates Pit Crew

Stryker & Stryker on their highway contract in Burlington County, New Jersey, have devised a method of handling pontoons under their Bucyrus 20-B ¾-yard shovel mounted on traction wheels, by means of which they have been able to dispense with all pit men.

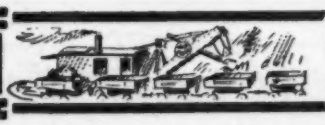
A 24-inch section of 1-inch chain is bolted to the center of the pontoon under which the dipper teeth are inserted. The pontoon is raised from the rear and placed in front of the shovel without assistance of anyone in the pit. Even the levelling off for this pontoon is done by the shovel before the pontoon is placed.

The runner, Raymond de Graw, is responsible for this kink.

Locating Motor Truck Noises

(Continued from page 61)

ing does not silence the noisy action, the gears should be inspected to see that the teeth are not worn too much and that they are meshed properly. If there is too much play between the gears, there is apt to be a knock or rattle in the rear axle rather than a grinding noise. In case the teeth have become chipped, the projections should be smoothed with a fine file. If considerable looseness exists between the gear teeth, an effort should be made to eliminate all lost motion.



DEVICES YOU OUGHT · TO KNOW ABOUT ·

New Track Shifter

A long-felt want in open-cut mining has been filled by the recent introduction of a track-shifting device by the Lake Superior Loader Co. It has been known to take the place of eight men, and with this device it is possible to lift the track 15 inches.

Track Shifter on Waste Dump on Mesabi Range

The machine is propelled and operated by a standard gasoline engine. The lifting action is obtained by means of a spud and gears. One operator drives and operates all racking and lifting motions through simple controls and standard clutches. In shifting track, the rail clamps are hooked over ball of rail and the spud is racked

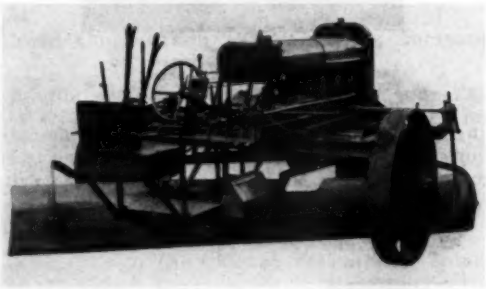
Side View of Same Machine

down with shoe between ties on side of track toward intended shift. The entire machine is then racked up on the spud, thus raising the rails and ties up on one side. The tilt of the spud then starts the whole raised mass sliding over to intended side. After reaching maximum height of lift, the leverage exerted gently slides the entire track section over to new position. The rail clamps are then loosened, machine moved forward two rail lengths and operation is repeated. In lifting track the spud is racked down in center of track with no tilt. The machine clamped to the rail, is then racked up, thus lifting the entire track section and allowing ample room for ballasting and tamping.

The Avery "Road-Razer" - Maintainer - Snow Plow

One big item of expense that city administrations have to contend with has been the purchase of seasonal equipment. For instance, snow removal equipment must be purchased even though it is used only a few times every winter. The rest of the year it stands idle, while the dreaded "overhead" and "depreciation" are busy.

To stop the needless waste of money for seasonal equipment, the Avery Company of Peoria, Illinois, have put out a special snow blade for their well-known "Road-Razer."



The Avery Scraper

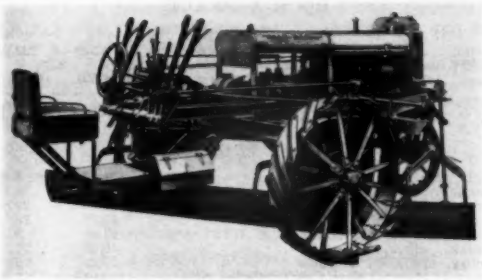
This blade consists of a section bolted securely to the top of the regular blade. Thus the cutting edge can cut through hard packed and frozen snow, while the wide blade enables the machine to quickly carry large quantities of snow to the curb.

The long blade is swung at a steeper angle so that a clearance of 26 inches is obtained between the blade and the left drive wheel. This enables the machine to handle a full load of snow without clogging.

The beauty of this equipment is that the machine does not lay idle when the ground is free from snow but can be used every day. It shaves rough surfaces smooth, carrying the dirt from the bumps and ridges into the ruts and holes.

This means that the "Road-Razer" is a machine you can keep busy all year 'round, shaving the roughest roads and streets smooth — doing more,

UMI



The Avery "Road-Razer"

faster and better work at lower cost than has ever been possible with any other method — then when snow fills your streets, removing it for you quickly, easily and at low cost.

The City of Salina, Kansas, has found the "Road-Razer" to be an ideal snow machine. An article in the *Salina Daily Union* reads as follows:

"The Salina Street Department passed one of the busiest days in its history today. The entire department, including two Avery 'Road-Razers' was put to work, taking the snow from uptown streets. By noon the streets in the business district were pretty well cleared, but the machines were kept busy the rest of the day on the remainder of the street system."

The Avery Company in developing the "Road-Razer" with snow blade attachment has done a great thing for city officials, not only in reducing the price of equipment but in building a universal machine that can be used in improving the conditions of roads and streets during both the summer and the winter months.

SHOTS FROM THE FIRING LINE

Central States Notes

BY M. J. WOODHULL AND F. M. GAYLORD

The Tice-Flynn Coal Company at Canton, Ohio, are opening up a stripping proposition near Canton, with a Bucyrus 80-B stripper and a 30-B coal loader. This is one of the finest stripping propositions in eastern Ohio, having an average of 14 feet of overburden and an average of 5½-foot vein of coal.

Mr. Chas. Flynn, who is general manager of the Tice-Flynn Coal Company, was connected with the Bucyrus Company for over fifteen years as an erector, and will have entire charge of this operation.

Mr. A. J. Tice was formerly vice-president of the Allied Coal Company and is now president of the Tice-Flynn Coal Company.

The stockholders of this company consist of the largest manufacturers in and around Canton, and they will consume a large percentage of the output of this plant.

Mr. Flynn has had charge of several stripping operations in Ohio, all of which have met with complete satisfaction. So the Tice-Flynn Coal Company starts its operation with Bucyrus equipment and an efficient organization.

An example of the efforts the Illinois Central Railroad Company is continually making to better its service and equipment is furnished by the double-tracking project between Clark's and the Tennessee Rivers, which has been under way since last May under the supervision of Resident Engineer Harris, who resides at Princeton. This double-tracking is being layed over a course of 16 and a half miles, largely for the purpose of cutting down grades and eliminating the curve at Garrison Creek, which have caused frequent delays and been a source of accidents. Ten miles of this new track will be ready for service by December 12, and the remainder within a short time thereafter. On the average 250 men have been employed on the work.

This stretch of 16 miles is the third link in the double-tracking of the Illinois Central line all the way from Clark's to Central City, all of which work has been under the supervision of Mr. Harris. A part of this project has involved the erection of a new bridge over Clark's River. The concrete piers of this bridge have been completed, and Mr. Harris is now waiting for the arrival of steel girders to finish the work.

The double-tracking was delayed considerably by the controversy over the right-of-way through property owned by A. Y. Martin, Mike Oliver and others near Riverview on the Tennessee River.

J. A. Wheeler, contractor, Crown Point, Indiana, was a visitor at the Road Show. We were glad to see him again.

Al. Duesing dropped in on us at the Road Show. It is understood that he and J. T. Poupore of Detroit are contemplating a partnership in excavating business. They want dragline work more than anything else. Therefore, probably a new firm in this line will soon be announced.

Our old friend H. L. Davis was at the Road Show with his son, Harold. Mr. Davis reports that his 20-B has been doing well.

M. W. Holben was another visitor at the Road Show. He is still adding to his list of successful sewer contracts.

Tom Blythe, who has 35 teams working on the Illinois Central Railroad, was in the other day and like all other contractors in this section feels he is going to have all the work necessary for next year.

H. C. Holmes, Macomb, Illinois, was in Chicago recently. He has a contract with the State Highway Department to build several bridges near Rushville, Illinois. Mr. Holmes was inquiring for a derrick to be used in connection with his operations.

Seth McCoy is located at Zebulon, Kentucky, where he is operating an Erie shovel.

W. J. and J. D. Eleam continue to handle the levers for the Garson Construction Co., at Wallins, Kentucky.

Craneman Wm. Fitzsimmons is dumping the bucket at Central City, Kentucky, for McCullough & Cheeney on the Illinois Central job.

Kentucky Highway Contracts Awarded January 1 to November 12, 1923

COMPILED BY KENTUCKY ASSOCIATION OF HIGHWAY CONTRACTORS

GRADING

County	County Road	Length	Amount
Knox	Barbourville-London	14.815	$ 130,214
Harlan	Harlan-Pineville	5.905	77,797
Morgan	West Liberty-Frenchburg	15.925	198,125
Muhlenberg	Central City-Calhoun	4.327	21,803
Webster	Dixon-Madisonville	4.915	31,136
Webster	Dixon-Henderson	3.870	21,029
Floyd	Mayo Trial	4.42	96,676
Johnson	Paintsville-Louisa	11.297	212,189
Lawrence	Louisa-Paintsville	19.618	356,172
Pike	Mayo Trail	8.867	159,733
Pike	Pikeville-Williamson	6.763	123,092
Union	Louisville-Paducah	15.953	123,454
Powell	Stanton-Campton	7.767	77,183
Pike	Mayo Trail	6.088	106,239
Shelby	Midland Trail	.092	4,274
Bell	Pineville-Harlan	11.509	227,566
Crittenden and Caldwell	Marion-Princeton	.333	4,584
Letcher	Whitesburg-Hazard	5.067	139,483
McCreary	Whitley City-Somerset	14.57	165,854
Daviess	Owensboro-Hawesville	2.64	25,051
Knox	Barbourville-Corbin	2.483	65,457
Powell	Stanton-Winchester	1.306	4,216
		168.539	$2,371,327

WATERBOUND MACADAM

Anderson	Lawrenceburg-Versailles	3.9	$ 24,231
Hardin	Elizabethtown-Red Mill	9.0	65,154
Hardin	Red Mill-Hart County	7.0	42,180
Henry	New Castle-Shelbyville	3.92	37,273
Boyle	Danville-Lebanon	7.2	38,638
McCreary	Whitley City-Tennessee Line	9.416	239,803
Mason	Lexington-Maysville	7.0	47,511
Jessamine	Lexington-Harrodsburg	4.995	117,477
Clinton	Albany-Monticello	4.284	51,465
Garrard	Lancaster-Richmond	6.1	47,403
Jessamine	Lexington-Nicholasville	5.4	34,044
Larue	Hodgensville-Buffalo	5.409	113,703
Nicholas	Lexington-Maysville	7.0	39,445
Pulaski	Somerset-Stanford	.137	8,180
		80.761	$ 906,597

GRAVEL

Christian	Hopkinsville-Gracy	9.358	$ 192,684
Hopkins	Dawsons Springs-Earlington	13.1	255,094
Henry, Trimble and Carroll	New Castle-Carrollton	12.14	271,123
Oldham	Lagrange-New Castle	3.39	69,634
Henderson	Henderson-Dixon	8.509	155,948
Hopkins	Dixon-Hopkinsville	10.378	136,604
Hopkins	Dixon-Hopkinsville	8.82	95,003
McLean	Calhoun-Owensboro	5.795	60,497
Webster	Henderson-Madisonville	19.16	209,802
		90.740	$1,446,389

REINFORCED CONCRETE

Grant	Lexington-Covington	8.301	$ 252,726
Kenton	Covington-Falmouth	10.282	344,550
Kenton and Boone	Lexington-Covington	9.352	316,788
Bath	Owingsville-Mt. Sterling	6.297	269,762
Montgomery	Mt. Sterling-Owingsville	6.502	220,189
Campbell	Alexandria-Falmouth	3.156	111,534
Campbell and Pendleton	Alexandria-Falmouth	10.112	393,648
Kenton	Covington-Falmouth	6.319	197,576
		60.321	$2,106,773

ROCK ASPHALT

County	County Road	Length	Amount
Nelson	Louisville-Bardstown	6.333	$ 229,247
Bullitt-Spencer and Nelson	Louisville-Bardstown	8.501	374,539
		14.834	$ 603,786

SURFACE TREATMENT

Boyle, etc.	8 roads	21.95	$ 14,492
Bracken, etc.	10 roads	61.33	34,155
Garrard, etc.	6 roads	31.04	22,961
Hart, etc.	5 roads	15.78	12,219
Nelson, etc.	3 roads	11.0	8,611
Pulaski, etc.	5 roads	40.98	27,385
Shelby, etc.	6 roads	27.2	22,676
Henry	New Castle-Shelbyville	3.917	3,838
McCreary	Whitley City-Tennessee Line	9.416	12,387
Boyle	Danville-Perryville	2.8	1,914
Fayette	Lexington-Richmond	8.32	8,715
Greenup	Catlettsburg-Greenup	1.5	1,223
Hardin and Jefferson	Louisville-Paducah	4.8	3,268
Harrison	Falmouth-Cynthiana	9.6	6,750
Hart	Western Dixie	6.67	4,054
Larue and Hart	Jackson	8.272	6,220
Madison	3 roads	11.17	8,318
Nicholas	Carlisle-Sharpsburg	4.3	1,893
Owen	2 roads	16.0	9,826
Scott	Georgetown-Cynthiana	3.2	1,972
Scott	2 roads	6.9	5,803
Whitley	Williamsburg-Corbin	3.69	2,772
Larue	Hodgensville-Buffalo	5.409	8,016
		315.244	$ 229,528

BRIDGES

Caldwell	Livingston Creek	$ 6,723
Kenton	Bank Lick	20,782
Morgan	Black Water and Grassy Creeks	32,450
Rowan	Triplett Creek	9,728
Hardin	Shaw's Creek	9,971
Powell	Red River	39,266
		$118,920

Eastern States Notes

BY E. G. LEWIS

Winston & Company are going strong with their work on the Scituate Reservoir.

F. H. Clement & Co. are doing some work for the Lackawanna & New England Railroad.

The Empire Engineering Co. have jobs on the Baltimore & Ohio Railroad and also have a contract for building a water works at Baltimore.

Richards & Gaston are busily engaged with their work on the Central Railroad of New Jersey.

T. Stuart & Sons are doing some work on the Maine Central Railroad.

H. Denberger Construction Co. are making good progress on their Lackawanna & New England Railroad work.

Clifford F. MacEvoy Co. are at work on a contract for the Delaware, Lackawanna & Western Railroad.

W. F. Carey is still engaged with his work for the New England Power Company in Vermont.

Booth & Flinn are making a fine showing on their Hudson River vehicular tunnel contract.

Chas. A. Sims is doing several jobs for the Pennsylvania Railroad and is also making a large fill for the Public Service Electric Company.

Arthur A. Johnson is busily engaged with his contract for widening Queens Boulevard.

Henry Steers, Inc., is building a big railroad bridge over Newark Bay for the Central Railroad of New Jersey and also a bulkhead at Kearney for the Western Electric Company.

The Arundel Corporation have some dredging work under way.

Northwestern States Notes

BY A. B. HANCE, PORTLAND, OREGON

Some grading work will be done this fall on the Wells, Nevada--Rogerson, Idaho Railroad, which will furnish Twin Falls with a short cut to the Pacific Coast market. Approximately ten miles of grading work out of Rogerson will probably be completed, and with the coming of spring work on the entire line will get under way.

The County Commissioners of Spokane, Washington, have decided on 45 miles of paving, or $400,000 worth of bonded road contracts, which will be awarded in January. All roads are graded and then surfaced with crushed rock.

Recommendation that the Lowell-Selway Falls Highway contract be awarded to the Morrison-Knudsen Company of Boise, Idaho, has been made by the Missoula offices of the Bureau of Public Roads. Morrison-Knudsen Company bid $50,995.40 and Siems-Carlson of Spokane $53,640.00 for the job, with contractors furnishing their own explosives. With the government furnishing the explosives, Morrison-Knudsen bid $49,755.40 and Siems-Carlson $49,280.00. Fourteen highway contracts have been let this season from the offices of the Bureau of Public Roads in this city, the Lowell-Selway Falls project being the last for the year. The total amount of the bids made for building roads involved in this year's program was $1,114,890, while the total mileage was 102.86, making an average of slightly better than $1000 to the mile. In addition, the bureau of Roads of Montana has surveyed 73.3 miles for contracts to be let in future years.

The Washington State Highway Department will get under way on the 1924 Highway Program in January when contractors' bids on three important road improvement undertakings will be opened and contracts awarded. The bids will be opened January 22nd for the following improvements: (1) Clearing about 10.1 miles of the Olympic Highway from Lunch Creek westerly in Grays Harbor and Jefferson Counties, Washington; (2) Clearing about 22.4 miles of the Olympic Highway between the Hoh River and the north line of the Quinault Indian Reservation in Jefferson County, Washington; (3) Surfacing with crushed rock about 10 miles of the Inland Empire Highway from Spangle northerly in Spokane County, Washington.

Contract for the construction work on the third unit of the Southern Pacific Company's new main line in Oregon between Klamath Falls and Eugene has been let to the Utah Construction Company of Ogden and San Francisco, and the Stewart & Welch Company of Seattle and San Francisco. The contracts provide for 32 miles of railbed and includes the building of a 3700-foot tunnel under the summit of the Cascade Range. The Utah Construction Company is to build 25.2 miles of the road under the agreement, while the Stewart & Welch Company is to build 6.9 miles and the summit tunnel. The work is to be carried forward as rapidly as the winter weather will permit. On the Klamath Falls end, work of grading 30.2 miles and the laying of 10 miles of track has been completed. Construction crews are now finishing an additional five miles of grade. Track-laying on the first five miles on the Oakridge end of the line is in progress. This, with the work just contracted for, will make a total of 73.7 miles of the line for which arrangements have been made. Completion of the line will provide a second route between San Francisco and Portland through a section of Oregon rich in timber and other products. It also is a country unparalleled for scenic beauty.

New highway construction planned by the Washington State Highway Department for 1924 includes the building of 51 miles of concrete highway and grading and surfacing of 60 miles of roadway, with all bridges necessary, at an estimated figure of $6,470,000. In addition to the 1924 program, contracts awarded during 1923 on approximately 110 miles of grading and surfacing will be completed next year. During the first half of 1924 the Highway Department will open bids on more than 231 miles of highway and on two bridge jobs. This work will include clearing, grading, surfacing with gravel, paving and bridging.

Contracts for about 100 miles of road, representing an expenditure of about $1,000,000, have been let within the last year by the Helena office of the Montana Bureau of Public Roads. The Helena office of the Federal Road-Building Organization has charge of all Federal Aid Projects in the State of Montana. Of the $1,000,000 represented by the contracts for road construction, about $750,000 of it comes from Federal funds, inasmuch as a great deal of the road work carried on is done on Indian lands which calls for 100% Federal funds. Work is still continuing, due to the open winter. Practically all of the projects now under construction are located east of the Garden City. One section of the Clarks Fork Road, which leads to Sandpoint, Idaho, however, is being constructed under supervision of the Helena office. The remainder of the highway comes under the jurisdiction of the Missoula office, which has charge of the forest roads.

Pacific Coast News

BY P. H. BIRCKHEAD, C. W. WHITNEY AND JACK SACKETT, SAN FRANCISCO, CALIFORNIA

Plans and specifications are being prepared by the United States Engineers Office, Custom House, San Francisco, for the following projects, bids for which will probably be called for early next year: Richmond Harbor, propose dredging estimated to cost about $180,000; Oakland Harbor, dredging estimated to cost about $180,000; Petaluma Creek, propose dredging to cost about $35,000; San Rafael, plan dredging to cost about $35,000.

The following contracts have been awarded by the Palo Verde Drainage District, Blythe, Riverside County: (1) Contract awarded to Chas. Thompson, Loews State Building, Los Angeles, for work at Ehrenberg Cut, involving 100,000 yards earthwork at 18c and 20c per cubic yard; (2) Contract to D. A. Foley Co., Hotel Van Nuys, Los Angeles, for work at Comer Bend, at 18c per cubic yard of earthwork.

Plans have been prepared by the National Oil Export Co., Los Angeles, for the construction of an oil loading wharf near Sunset Beach, in Orange County. The wharf will be 40 x 500 feet, with a 4,000-foot long approach, protected on each side with double piling. Plans have been submitted to United States Engineers Office, Central Building, Los Angeles, for approval.

Bonds voted by the City of Santa Monica, Los Angeles County, in amount of $1,000,000 for additions

and extensions to the present water system. Survey and preliminary reports have been filed with the City Council by Consulting Engineers Olmsted and Gillelen, Hollingsworth Building, Los Angeles.

City Council of Santa Monica has instructed City Engineer Coffin to prepare plans and estimates for the construction of a joint outfall sewer from Topango Canyon to Hyperion for the cities of Santa Monica, Los Angeles, Venice, and Pacific Palisides Association. The plan has been approved by each of the above cities.

The Southern Pacific Company have also awarded a contract for another section of the Natron Cutoff to Stewart & Welch, Empire Building, Seattle, Washington, this section consisting of 7 miles of railroad construction and a 3700-foot tunnel through the summit of the Cascade Range.

The Kern River Water Storage District, recently formed in Kern County, has elected the following officers: W. G. Hull, President, and F. G. Munzer, Secretary. This district will embrace about 250,000 acres of land and proposes to construct an irrigation system to cost about $15,000,000.

A contract has been awarded to the Utah Construction Co., Phelan Building, San Francisco, by the Southern Pacific Railroad for the construction of a 25-mile unit of the Natron Cutoff, in Klamath County, Oregon. This is the second unit of the Natron Cutoff to be awarded. The complete line will extend from Klamath Falls to Eugene, Oregon.

Maps and surveys are being completed by the Board of Public Service, Los Angeles, for the construction of the following works on Kings River, Fresno County, being part of a large hydro-electric development project for the city of Los Angeles. Plans call for the following: Dam, Simpson Reservoir, to store 50,922 ac. feet, will be 215 feet high, 2,670 feet long on top, 180 feet long on bottom, 20 feet wide on top, of loose rock, and earth-fill construction with a wasteway around dam; Tunnel, 43,022 feet in length, concrete lined, 5 x 4-foot diameter, is planned; Penstock, 2,450 feet long, diameter at top 81 inches, at bottom 60 inches; Power Plant, Kings River Power Plant No. 3 is to develop 34,023 H. P., using Impulse Water Wheels and Generators, at a fall of 1,497 feet. Estimated cost $7,049,850. Protests will be heard shortly on granting the water rights.

Steps are being taken by the Boards of Supervisors of Monterey County, Fresno County, Kings County, and Tulare County, to complete the 29-mile San Lucas to Coalinga Highway in the Sierra-to-the-Sea Highway. Estimated cost is $800,000.

Nevada Contracting Co., Fallon, Nevada, who bid $480,862, low bid, submitted to the California Highway Commission, 515 Forum Building, Sacramento, recently, for the grading and gravel or broken stone surfacing of 9.9 miles in Shasta County from Bayha to Halfway Creek.

Southern States Notes

BY C. N. BALLENTINE AND W. W. WHORLEY, BIRMINGHAM, ALABAMA

Bids were received at Senatobia, Mississippi, January 3rd, on 421,000 yards of drainage and cleanout work in the Tate Panola District. Those bidding were the W. E. Callahan Construction Company, Fred C. Morgan, and A. V. Wills & Sons Company, the latter being awarded the contract.

W. J. Newman of Chicago has about completed excavation for the new Peabody Hotel on the site of the old Fransiola Hotel in Memphis. The light excavation was handled by a Thew Type O. The deeper cuts were taken by a 30-B equipped with a 29-foot boom. This shovel has been loading Mack trucks on a 19-foot bank, and is piloted by W. F. McConnell. Pete Helnnouse is keeping the boiler hot.

N. C. McGinnis & Company, Memphis, Tennessee, were recently awarded contract for construction of drainage ditches and levees in the Panola Quitman Drainage District which will amount to approximately 6,000,000 yards.

H. W. Poag is operating a Class-31 dragline for the Armour Phosphate Company near Columbia, Tennessee.

The Franklin Limestone Company of Nashville, Tennessee, are making many improvements and enlarging the output of their quarry at Mims, Tennessee, to care for the rapidly increasing demand for their product.

Mr. John M. Ryan, Division Engineer, N. C. & St. L. Ry. has recently returned to his duties in Nashville after an extended vacation in California.

The Alabama State Highway Commission on December 19th approved appointments of Engineering forces of the Department made for 1924 by W. S. Keller, State Highway Engineer. The First Division office located at Decatur will be consolidated with the Second Division office at Birmingham, and will be in charge of Mr. A. L. Smith, formerly of the Selma office. Mr. C. N. Mitcham is retained as Division Engineer of the Third District with office at Montgomery, where he will be assisted by Mr. H. G. Culverhouse. Mr. R. D. Jordan is promoted to Division Engineer of the Fourth District with office at Selma. Col. W. A. McCalla is retained as principal Assistant Engineer of the State Highway Department, and in addition is made Engineer in Charge of Maintenance, which position has been held by Mr. Culverhouse.

According to a recent issue of a St. Petersburg, Florida, newspaper, Florida is spending $60,000,000 in the state's greatest road-improvement program, affecting practically all of the 63 counties. More than half that enormous amount was voted by the various counties since the first of the year. In addition to the road bonds passed by the electorate, other millions are being expended by developers who are opening up new estate sites throughout Florida and particularly on the west coast.

Activity at this time is centered on the main arteries leading to winter resorts in the state, over which roads thousands of motor cars will travel during the season.

In Pinellas County, where St. Petersburg is located, close to $5,000,000 is being spent in the establishment of new highways and in re-paving and widening the old roads.

Another bridge engineering feat, which, when completed, will be the longest of its kind in the world, is the Gandy Causeway, costing $2,500,000, spanning Tampa Bay, connecting this city with Tampa. This project will be completed in the late spring of 1924.

St. Louis Items

BY A. B. KOENIG

N. C. McGinnis & Co. of Memphis, Tennessee, were awarded contract for the drainage of 90,000 acres of rich delta land in Panola, Quitman and Tallahatchie Counties, Mississippi, at an estimated cost of $1,500,000. The project involves the removal of 6,500,000 cubic yards of excavation both for ditches and levees.

The Missouri Valley Bridge & Iron Co. finished the Missouri Pacific Railroad bridge across Black River at Luehrman, Arkansas. Superintendent Twiss shipped this outfit to DeValls Bluff, Arkansas, where they will construct a wagon bridge across White River, a link in the banked highway which connects Memphis and Little Rock.

The Arkansas Lime Company of Ruddells, Arkansas, has changed its name to the Batesville White Lime Co., increased its capital stock from $100,000 to $300,000, and will begin work on one of the largest lime plants in the South within the next few days on a quarry site near Bethesda, Independence County, Arkansas. It also will continue to operate the big three kiln plant at Ruddells. The new plant will manufacture hydrated lime as well as building and chemical lime. The estimated cost of the new plant is $150,000.

D. M. Harbour, 4921 Parkview Place, St. Louis, has a 15-team outfit idle at St. Genevieve, Missouri. He wants a job for them.

The Costello Brothers, Mike, Rich and Con, were here New Year's Day, not to celebrate but were called here on account of the illness of their mother who had an operation performed, which proved a success. Mother Costello is getting along as nicely as can be expected from an old lady.

Reed & Lowe of Birmingham, Alabama, finished their contract jobs on the Frisco Railroad in Tennessee and Alabama. They report three good concrete outfits and a standard gauge shovel outfit idle.

West Virginia

H. E. Witt is operating a 70-C Bucyrus for Boxley, Goodwin & Bray at Iaeger, West Virginia.

According to C. P. Fortney, Chairman of the State Road Commission, 3532 miles of road has been designated as State Route, upon which funds derived from state bonds can be used for construction and reconstruction purposes. Work is being carried on simultaneously in every county in the state. 30,000,000 have been appropriated by the Legislature in the past three years, and the state has received its Federal Aid allotment of $2,033,352.08. As of July 1, 1923, 826.75 miles of road have been completed and 1099.50 miles are under construction. 803.8 miles of road on state projects has been approved for construction with state bonds and Federal Aid.

During the season of 1924 it is expected to complete by grading or paving some of the more important routes in the state. Route No. 3—177.4 miles—known as the James River and Kanawha Turnpike (Midland Trail) traverses the state west to east, from Kenova, Huntington, Charleston, Gauley Bridge, Rainelle, Lewisburg, White Sulphur Springs, to the Virginia State Line. This route should be hard surfaced and opened to the public with the possible exception of 13 or 14 miles which will be let for grading and paving, in 1924, and may lap over into the 1925 construction season.

State Route No. 1, known as the Northwestern Turnpike extending east from Parkersburg via Clarksburg, Grafton, Romney, to the Virginia line, is under contract either for grading or paving at all points except: 4 miles in Wood County adjacent to Ritchie County line; 3 miles in Ritchie County adjacent to Wood County line; 7 miles in Taylor County adjacent to Preston County line; 9.5 miles in Preston County adjacent to Taylor County line; 7 miles in Hampshire County adjacent to Virginia line.

Route No. 4 which is our main North and South Road via Morgantown, Fairmont, Clarksburg, Weston, Sutton, Summersville, Beckley, Princeton, and Bluefield, is under contract for grading or paving with the exception of: Gauley Bridge to Swiss, a distance of 10 miles; Summersville to Sutton, a distance of 29.5 miles; Bulltown to 3 miles south of Weston, a distance of 25.4 miles.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us.

Bucyrus Company Issues New Bulletins

The Bucyrus Company has just issued the following three new bulletins:

BULLETIN B-201—Describing the 20-B Diesel shovel, dragline excavator and crane, which machine has recently been announced.

BULLETIN F-302—Describing the 30-B Diesel or gasoline shovel, dragline and crane.

BULLETIN C-304—Describing the 30-B steam shovel, dragline and crane.

These bulletins may be obtained from the *Bucyrus Company, South Milwaukee, Wisconsin,* or from any of their branch offices. The postal inclosed in this issue will facilitate this application.

TRADE NOTES

Ford Motor Company Making New Truck Body

The Ford Motor Company enters the new year with a new product, an all-steel combination truck body and cab mounted on the standard Ford One-Ton chassis to be sold as a complete unit.

The new body is of the open express type, so constructed that it may be readily converted into other body combinations by using stakes, side boards, canopy top, screen sides, etc.

"In fact," says the Ford statement, "the purpose in producing the new body was to place a low cost general utility truck, meeting both agricultural and commercial requirements at the disposal of ton truck users."

The body is built of steel to withstand the most severe usage and presents a new development in construction. The steel sills are reinforced with wood in order to lessen vibration and road shocks, thus making for more durability and longer life.

The loading space is seven feet two inches in length by four feet in width and of convenient and practical depth. The end gate is strongly braced and secured by heavy chains which hold it in position when lowered.

The cab, also of steel construction, is extra roomy. The seat is of artificial leather, well-cushioned on four-inch springs. Protection from the weather is afforded by close-fitting door curtains mounted on uprights and opening and closing with the door. An oblong window in the back of the cab gives ample facilities for rear vision, adding to the safety as well as the convenience of the driver.

The new truck, which is already on display in many Ford dealers' showrooms throughout the country, sells complete with steel cab body for $490.00 f. o. b. Detroit, being priced in accordance with the standard Ford policy.

In addition to the saving offered truck users in this body is the convenience of now being able to buy the Ford Ton truck complete and ready to put into service.

Good Made Head of Loomis Machine. Manufacturers of Clipper Drills

Bruce Z. Good was elected president of the Loomis Machine Company Tuesday afternoon at the annual meeting.

He succeeds the late George D. Loomis. Mr. Good previously was secretary-treasurer of the company.

Earl B. Naylor was elected vice-president, W. L. Hertzer secretary and treasurer and D. L. Lott superintendent.

These officers constitute the board of directors which was chosen at the annual stockholders' meeting preceding the meeting of directors.

The Loomis Machine Company was organized in 1842 and has been in operation since that time under the same ownership. With a record of 82 years the company is one of the oldest in the United States.

A new one-reel motion picture has just been completed by the du Pont Company entitled "Dynamite At Work," which shows the use of that explosive in various parts of the country and under various conditions. Views of some of the largest dynamite shots made during the past year, where thousands of pounds of the explosives were used, are featured. One highly interesting view is that of a slow motion picture shot of some 45,000 pounds of dynamite taken in a quarry. Other interesting views show the breaking of an ice jam, tearing down an old building, digging ditches in mosquito control work, blowing out stumps, and clearing roads of snow in the Rocky Mountains.

Another picture entitled "Dynamite in Quarry Work," has also been prepared. This is also a one-reel picture. Both pictures are available on request to the Company.

We are in need of additional copies of the October 1922 issue of The Excavating Engineer. We will pay 25c for each copy returned.

THE EXCAVATING ENGINEER
South Milwaukee, Wisconsin

Digging the Dixie Highway in Kentucky

(Continued from page 63)

should ever be lucky enough to own another shovel I would want it to be a Bucyrus. Haven't had any repairs to buy worth notice except dipper teeth. Have worn out several sets of them. I think I have had the hardest digging here I have ever had."

The road has been graded 24 feet wide in cuts and 28 feet in fills with a 16-foot waterbound macadam surface. The cutting has run from 2 to 20 feet.

The rock has only been blasted in the heavier cuts, three to eight-foot holes being driven and charged with a half to five pounds of explosive. Dumorite and Trojan powder has been used.

Water is pumped to the shovel with a gasoline force pump.

DeWitt Van Diver has acted as superintendent in charge. We acknowledge our indebtedness to Mr. J. Harvey Van Diver for the data he has so courteously supplied.

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Bucyrus 50-B Revolving Shovel Loading Coal in the Strip Mine of the Pyramid Coal Company at Marion, Illinois. The large shovel in the background is a Bucyrus 320-B.

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ADDRESS ALL COMMUNICATIONS TO

THE EXCAVATING ENGINEER PUBLISHING COMPANY

BRADLEE VAN BRUNT, Manager and Editor

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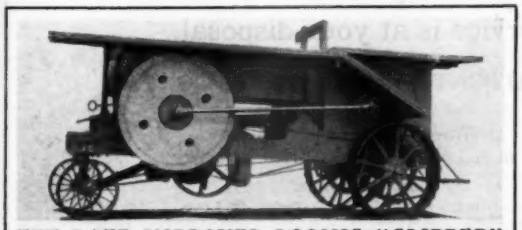

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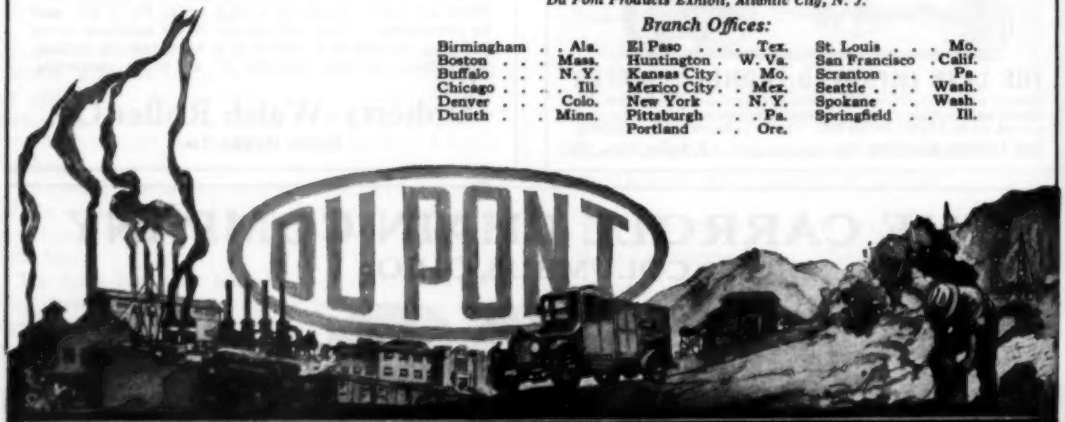

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